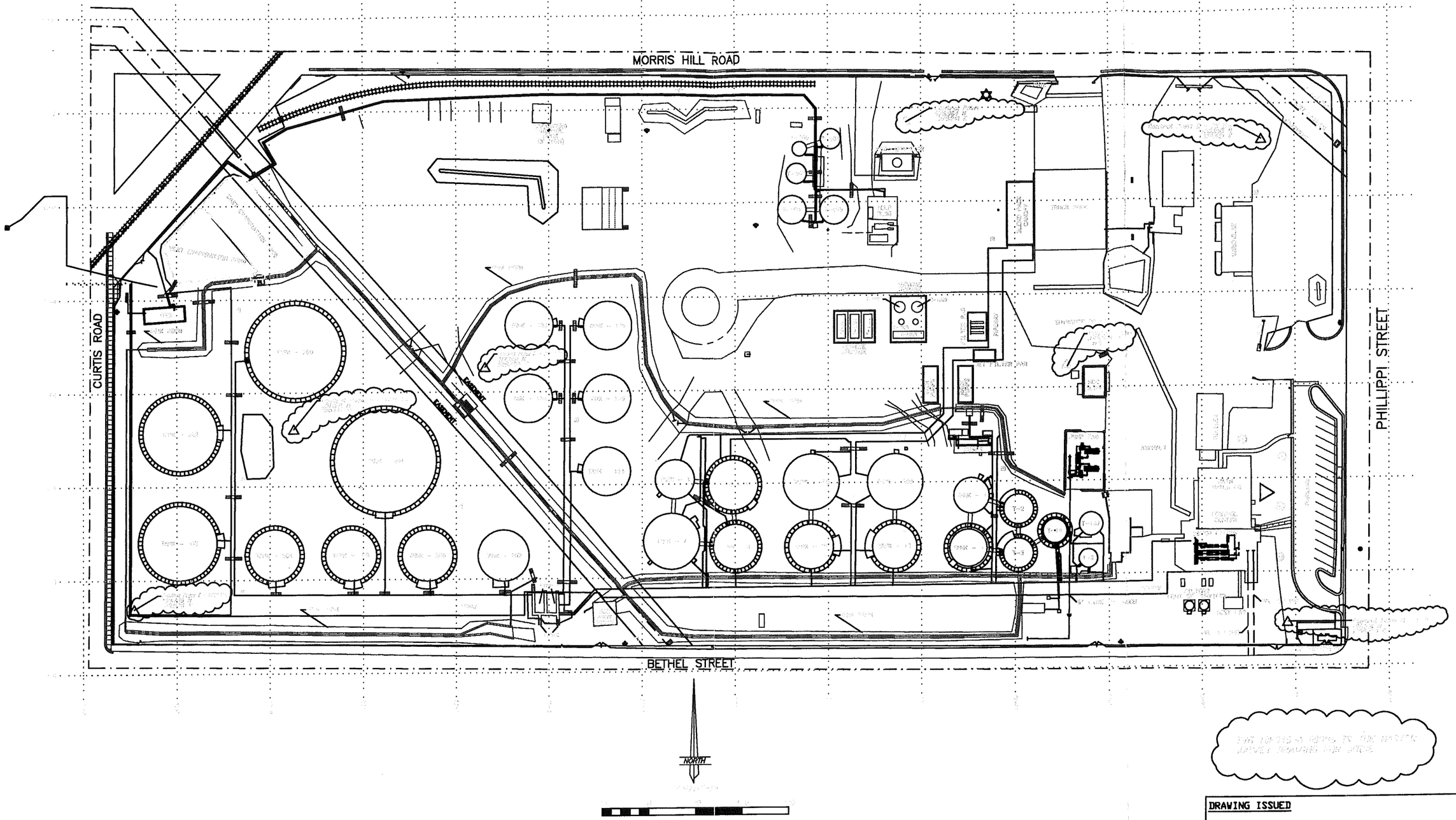

DRAWING ISSUED

_____ FOR REVIEW _____ FOR BID
_____ FOR APPROVAL _____ FOR CONSTRUCTION
_____ FOR REFERENCE _____ FOR AS-BUILT
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REFERENCE DRAWINGS

REVISIONS

Chevron Pipe Line

SCALE 1"=50'-0" DATE 1/22/2001 APPROVED EKR
DR. KSH CH. VHE DR. APP. ENGR. VHE
DPR'G DEPT. ENG. DEPT.

PLOT PLAN
BOISE PUMP STATION
BOISE PUMP STATION, ADA
2000 CORE DRAWING UPGRADE

COST CODE IDF046-A-00995 0

Vapor Extraction System

Emissions from the VES consist of volatile organic compounds (VOCs) from extracted vapors that are not incinerated (control efficiency is 95%), and pollutants of combustion generated from the incineration process.

The potential annual emissions from the VES are based on the limits in the State issued permit to construct for the system. The potential hazardous air pollutant (HAP) emissions from this source are based on the potential VOC emissions. Potential emissions from the VES at CPL are presented in Table 6-1.

The Idaho State air quality regulation, IDAPA 58.01.01.786, requires that discharges from incinerators contain no more than 0.2 pounds of particulate per one hundred pounds of refuse burned. However, CPL's incinerator does not burn "refuse", and, therefore, IDAPA 58.01.01.786 does not apply to this incinerator. The AP-42 industrial flare emission factor for soot ranges between 0 and 274 µg/l depending on how much the flare is smoking. For nonsmoking flares, such as the VES, the soot concentration is 0 µg/l. This is in compliance with the discharge requirement.

Reference: State of Idaho Permit to Construct #0020-0026; AP-42 Section 13.5, 9/91 (Reformatted 1/95)

SECTION 6

Emission Estimate References And Documentation

This Section contains emission estimates for the sources described in Section 3.

Table 6-1

CHEVRON PIPE LINE COMPANY
BOISE STATION
POTENTIAL VAPOR EXTRACTION SYSTEM (VES) EMISSIONS
UPDATED April 2005

	Emissions					
	PM10	SO2	NOx	VOC	CO	Benzene
Tons/Year	5.3E-02	0.0064	5.30	25.00	3.20	0.053

These emissions are permit limits in Permit Number 001-00026.

Fixed Roof Storage Tanks

VOC emissions from fixed roof storage tanks vary as a function of vapor pressure of the stored liquid, utilization rate of the tank, tank capacity and dimensions, tank color, and atmospheric conditions at the tank location.

Emissions of HAPs were calculated using EPA's TANKS program, version 4.09b. The average weight percent of each HAP in the various liquids stored is based on PERF data.

The VOC emissions from above ground storage tanks result from liquid evaporation during storage and from changes in the liquid level. Evaporation losses occurring during filling and emptying operations are known as working losses. Losses occurring during standing storage are known as breathing losses. Emissions from fixed roof storage tanks were calculated using the U.S. EPA TANKS program.

Table 6-2 presents the potential VOC emissions from the fixed roof petroleum liquid storage tanks at CPL. All TANKS data is contained in the attached disk. Potential HAP emissions from these tanks are shown in the emissions summary tables (Tables 1-1 and 1-2) in Section 1.

Reference: TANKS, version 4.09b

Table 6-2 Chevron Pipe Line Fixed Roof Storage Tank Emissions

Tank	Thruput (gal)	Tank Volume (gal)	Turnover	Total VOC (lb/yr)	2,2,4-Trimethyl pentane	Benzene	Biphenyl	Cresol (-m)	Ethyl benzene	Hexane (-n)	Isopropyl benzene*	Naphthalene	Phenol	Styrene	Toluene	Xylene (-m)
9	500,010	42,000	11.90	8032.44	24.32	31.49			2.04	53.81	0.15	0.02		0.11	35.66	8.99
14	1,499,988	115,000	14.29	19585.71	59.31	76.79			4.97	131.20	0.38	0.04		0.28	86.96	21.92
162	63,782,880	609,000	104.73	800.51			0.12	0.05	22.20	59.64	4.08	0.93	0.10		94.74	72.09
163	51,465,505	609,000	84.51	594.61	9.64		0.05	0.09	4.14	41.77	1.60	0.55	0.91		22.06	14.49
201	239,528,142	2,734,200	87.60	2708.73	43.92		0.21	0.39	18.87	190.27	7.28	2.50	4.14		100.48	66.03
400	349,986	42,000	8.30	5577.27	16.89	21.87			1.42	37.36	0.11	0.01		0.08	24.76	6.24
401	700,014	84,000	8.30	11041.89	33.44	43.29			2.80	73.97	0.21	0.02		0.16	49.03	12.36
402	700,014	84,000	8.30	11041.89	33.44	43.29			2.80	73.97	0.21	0.02		0.16	49.03	12.36
403	1,399,986	168,000	8.30	21954.51	66.48	86.08			5.57	147.07	0.42	0.04		0.31	97.48	24.57
404	1,399,986	168,000	8.30	21954.51	66.48	86.08			5.57	147.07	0.42	0.04		0.31	97.48	24.57

*same as cumene

Floating Roof Storage Tanks

VOC emissions from floating roof storage tanks vary as a function of vapor pressure of the stored liquid, utilization rate of the tank, tank capacity and dimension, tank color, and atmospheric conditions at the tank location (including average wind speed).

Emissions of HAPs were calculated using EPA's TANKS program, version 4.09b. The average weight percent of each HAP in the various liquids stored is based on PERF data.

Emissions from floating roof storage tanks were calculated using the U.S. EPA TANKS program.

Table 6-3 presents the potential VOC emissions from the floating roof storage tanks at CPL. All TANKS data is contained in the attached disk. Potential HAP emissions from these tanks are shown in the emissions summary tables (Table 1-1 and 1-2) in Section 1.

Reference: TANKS, version 4.09b

Table 6-3 Chevron Pipe Line Floating Roof Storage Tank Emissions

Tank	Thruput (gal)	Tank Volume (gal)	Turnover	Total VOC (lb/yr)	2,2,4-Trimethyl pentane	Benzene	Biphenyl	Cresol (-m)	Ethyl benzene	Hexane (-n)	Isopropyl benzene*	Naphthalene	Phenol	Styrene	Toluene	Xylene (-m)
164 (Gasoline)	14,217,135	567,000	25.07	4078.53	13.21	16.45			1.50	27.67	0.15	0.16		0.10	20.59	7.04
164 (Jet Fuel)	24,003,294	567,000	42.33	116.49			0.23	0.03	0.45	0.75	0.12	0.35	0.04		1.40	1.58
165	70,546,107	567,000	124.40	4282.83	17.22	19.09			3.39	30.40	0.46	0.78		0.26	31.31	17.07
166	32,627,793	567,000	57.50	4145.30	14.52	17.32			2.12	28.56	0.25	0.37		0.15	24.09	10.32
200	148,919,281	2,604,000	57.19	6180.26	23.38	26.76			4.10	43.28	0.53	0.86		0.30	40.93	20.39
202	94,678,141	1,621,200	58.40	4177.77	16.36	18.39			3.07	29.48	0.41	0.68		0.23	29.27	15.39
203 (gasoline)	95,620,105	1,629,600	58.68	4180.00	16.40	18.42			3.09	29.51	0.41	0.69		0.23	29.39	15.50
203 (diesel fuel)	71,701,304	1,629,600	44.00	221.77	0.15		0.15	0.11	0.11	0.56	0.07	0.37	0.57		0.38	0.44
204 (gasoline)	19,636,802	777,000	25.27	3063.29	10.40	12.62			1.38	20.97	0.16	0.21		0.09	16.84	6.66
204 (diesel fuel)	33,595,308	777,000	43.00	151.71	0.11		0.10	0.07	0.08	0.42	0.05	0.25	0.39		0.28	0.32
205 (gasoline)	45,799,694	777,000	58.94	3153.00	12.16	13.78			2.21	22.17	0.29	0.48		0.16	21.54	11.07
205 (diesel fuel)	33,172,956	777,000	42.69	149.88	0.11		0.10	0.07	0.08	0.42	0.05	0.25	0.38		0.28	0.31
206 (gasoline)	44,867,462	777,000	57.74	3149.80	12.10	13.73			2.18	22.13	0.29	0.47		0.16	21.38	10.91
206 (diesel Fuel)	33,626,136	777,000	43.28	151.82	0.11		0.10	0.07	0.08	0.42	0.05	0.25	0.39		0.28	0.32
207 (gasoline)	44,825,336	777,000	57.69	28032.02	87.44	111.29			8.50	188.81	0.76	0.52		0.51	131.85	38.75
207 (diesel Fuel)	33,593,502	777,000	43.00	198.67	0.87		0.11	0.08	0.41	3.72	0.18	0.30	0.46		2.02	1.46

*same as cumene

Fugitive Emissions

U.S. EPA has provided a protocol for equipment leak emission estimates from various equipment at marketing terminals. Fugitive emissions at CPL were calculated using these factors. Emissions of HAPs were calculated using the average weight percent of each HAP in the liquid.

Average emission factors do not require individual screening values for each component. All that is needed is the number of components in each source category. The number of components in each category is multiplied by the appropriate average emission factor. The resulting mass for each category then can be added to determine the total fugitive emissions from the facility.

Table 6-4 presents the potential VOC emissions from the fugitive sources at CPL. The number of units in each source category is given as well as the emission factor that was used. Potential HAP emissions for these sources are shown in the emissions summary tables (Tables 1-1 and 1-2) in Section 1.

Reference: AP-42 Section 5, 1/95; Protocol for Equipment Leak Emission Estimates, November 1995

CHEVRON PIPE LINE COMPANY
BOISE STATION
POTENTIAL FUGITIVE VOC EMISSIONS
UPDATED April 2005

Source	Service	Number Of Units	Emission Factor* (lb/hr/unit)	Emissions (Tons/Yr)
Separators		1	0.2	2.63
Valves	Liquid	823	9.48E-05	0.34
Fittings	Liquid	921	1.76E-05	7.1E-02
Pump Seals		6	1.19E-03	3.1E-02
Others	Liquid	84	2.87E-04	0.11
		TOTAL		**3.18**

For Separators, emission factor units are lb/1000 gallon. Separator is limited to 625,714 bbls/yr.
*Table 2-3 Marketing Terminal Average Emission Factors, Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995
Emissions = (# of units)(emission factor)(hours/day)(365)/2000

Number of valves is actual times 1.1
Number of fittings is actual times 1.1
Number of pump seals is actual
Number of others is actual times 1.1

Actual counts increased to accomodate possible overlooked sources.

Loading Rack

The potential VOC emissions from gasoline loading were calculated based on the manufacturer's guarantee of a maximum of 35 mg of VOC emitted per liter of gasoline loaded. Potential VOC emissions from loading diesel and jet fuel were calculated using AP-42 equations and assuming no controls, even though vapor destruction applies to these fuels as well. This is because emissions from these fuel types are relatively low (i.e. less than 35 mg/l allowed). Emissions of HAPs were calculated using the average weight percent of each HAP in the liquid being loaded.

Recovered vapors are sent to a thermal oxidizer that is supplemented with natural gas.

The potential annual VOC emissions from gasoline loading were calculated based on the manufacturer's specification of 35 mg of VOC emitted per liter of gasoline loaded. The following equation was used to determine potential annual emissions (PAE) from gasoline loading:

$$PAE\ (tons/yr) = TP*(3.785\ l/gal)*(35\ mg/l)*(0.0000022\ lbs/mg)*(1\ ton/2{,}000\ lbs)$$

where

TP = maximum gasoline throughput in gallons/year.

Emissions from diesel and jet fuel loading were calculated using the AP-42 equations for truck loading as shown below. Transmix, which is a mixture of all fuel types, is loaded at a separate rack not connected to the vapor destruction unit. Emissions from transmix loading were based on gasoline content, for a worst case scenario, using the same AP-42 equations.

$$LL = (12.46*VMW*TVP*SF/TL)*(1 - VRE/100)$$

and

$$PAE(tons/yr) = LL*TP/2{,}000$$

where:

LL = loading loss (lbs/1,000 gal loaded);
SF = saturation factor;
TL = temperature of bulk liquid loaded;
TVP = true vapor pressure (psia);
VMW = molecular weight of vapors;
VRE = vapor recovery efficiency
= 0 for no control.

Table 6-5 presents all potential VOC emissions from the truck loading rack at NWTC. Potential HAP emissions from this source are shown in the emissions summary tables (Tables 1-3 and 1-4) in Section 1.

Reference: Manufacturer's specifications, John Zinc Model ZTOF; AP-42 Section 5.2, 1/95

Vapor Destruction System

The potential annual emissions were calculated based on the manufacturer's specifications for the system.

$$PAE_i(\text{tons/yr}) = TP*(3.785\ \text{l/gal})*EF_i*(0.0000022\ \text{lbs/mg})*(1\ \text{ton}/2{,}000\ \text{lbs})$$

where:

TP = maximum throughput in gallons/yr;
EF_i = guaranteed emission factor in mg/l
= 10 for carbon monoxide
= 4 for nitrogen oxides.

Table 6-5 presents the potential emissions from the truck loading and vapor destruction system at NWTC.

The Idaho State air quality regulation, IDAPA 58.01.01.786, requires that discharges from incinerators contain no more than 0.2 pounds of particulates per one hundred pounds of refuse burned. However, this incinerator does not burn "refuse", and, therefore, IDAPA 58.01.01.786 does not apply to this incinerator. The AP-42 industrial flare emission factor for soot ranges between 0 and 274 µg/l depending on how much the flare is smoking. For nonsmoking flares, such as the VES, the soot concentration is 0 µg/l. This is in compliance with the discharge requirement.

Reference: Manufacturer's data, John Zink Model ZTOF; AP-42 Section 13.5, 9/91 (Reformatted 1/95)

NORTHWEST TERMINALLING COMPANY
BOISE TERMINAL
POTENTIAL TRUCK LOADING VOC EMISSIONS
UPDATED April 2005

Contents	VMW	TVP	TL	SF	TP	VRE	VOC LL	Tons	CO LL	Tons	NOx LL	Tons
Gasoline	66	4.9000	516.6	1.00	214,816	>95%*	<35 mg/L	31.37	<10 mg/L	8.96	<4 mg/L	3.59
Gasoline**	66	4.9000	516.6	1.00	1,820	0	7.8E+00	7.10				
Transmix	66	4.9000	516.6	1.00	2,000	0	7.8E+00	7.80				
Jet Fuel	130	0.0085	516.6	1.00	56,091	0	2.7E-02	0.75	<10 mg/L	2.34	<4 mg/L	0.94
Diesel	130	0.0074	516.6	1.00	94,794	0	2.3E-02	1.10	<10 mg/L	3.96	<4 mg/L	1.58
						TOTAL		**48.1**		**15.3**		**6.1**

LL = Loading loss (lbs/1000 gallons)
SF = A saturation factor
TL = Temperature of bulk liquid loaded
TP = Throughput (gallons X 1000)
TVP = True vapor pressure of liquid loaded
VMW = Molecular weight of vapors
VRE = Vapor recovery efficiency
LL = Loading loss

LL *= [{12.46(M)(P)(S)}/T][1-(VRE/100)], or based on incinerator efficiency.
M = VMW, P = TVP, S = SF, and T = TL
*From AP-42 Fifth Edition, Section 5.2, Transportation and Marketing of Petroleum Liquids, 1/95
TONS LL = [(TP)(1000 gal/Mgal)(3.785 liter/gal)(mfg conc.(mg/liter))(2.2046E-6 lb/gram)]/(2000 lb/ton) with incinerator, or
TONS LL = [(LL)(TP)]/2000 without incinerator.

ASSUMPTIONS AND OTHER INFO:
1) 35 mg/l is a permit limit in Permit Number 001-00026.
2) VMW, TVP, and TL are from original Tier I Permit Application for consistency.
3) Jet and diesel loading VOC losses as per AP-42.
4) VOC, CO, and NOx emission rates guaranteed by manufacturer- same as original application.
5) VOC emissions are from incinerator and do not include fugitive losses. Fugitive losses accounted for in the fugitive emission data sheet.
6) Throughputs are based on allowable throughputs shown in Operating Permit Application, dated June 12, 1995, plus throughput increase expected as a result of adding DRA to system, which increases gasoline by 825,000 barrels and diesel by 90,000 barrels.
7) VOC and CO emission estimate is based on manufacturer's rate.

*The vapor burner manufacturer does not guarantee vapor destruction by a certain percent (as is asked for in the "VRE" parameter), but does guarantee vapor destruction to the specified level. The actual efficiency rating will vary depending on the concentration of hydrocarbons (HC) in the incoming vapor stream. The higher the concentration, the higher the efficiency.
**As done in original Tier I Application, provided for potential operational upset of vapor destruction unit.
The vapor destruction unit will operate while diesel and jet is loaded. However, the emissions from these two fuel types is nearly zero when uncontrolled, so no control factors were used above. Therefore, VOC "TONS" is determined using regular AP-42 calculations.

Transmix is a combination of all fuel types. It is loaded at a separate loading rack. This rack is not connected to the vapor destruction unit.
Assumed transmix same as gasoline content for worst case scenario.

Fixed Roof Storage Tanks

VOC emissions from fixed roof storage tanks vary as a function of vapor pressure of the stored liquid, utilization rate of the tank, tank capacity and dimensions, tank color, and atmospheric conditions at the tank location.

Emissions of HAPs were calculated using EPA's TANKS program, version 4.09b. The average weight percent of each HAP in the various liquids stored is based on PERF data.

The VOC emissions from above ground storage tanks result from liquid evaporations during storage and from changes in the liquid level. Evaporative losses occurring during filling and emptying operations are known as working losses. Evaporative losses occurring during standing storage are known as breathing losses. Emissions from fixed roof storage tanks were calculated using U.S. EPA TANKS program.

Table 6-6 presents the potential VOC emissions from the fixed roof petroleum liquid storage tanks at NWTC. All TANKS data is contained in the attached disk. Potential HAP emissions from these tanks are shown in the emissions summary tables (Tables 1-3 and 1-4) in Section 1.

Reference: TANKS, version 4.09b

Table 6-6 Northwest Terminalling Company Fixed Roof Storage Tank Emissions

Tank	Thruput (gal)	Tank Volume (gal)	Turnover	Total VOC (lb/yr)	2,2,4-Trimethyl pentane	Benzene	Biphenyl	Cresol (-m)	Ethyl benzene	Hexane (-n)	Isopropyl benzene*	Naphthalene	Phenol	Styrene	Toluene	Xylene (-m)
1	23,513,406	269,430	87.27	335.72			0.05	0.02	9.31	25.01	1.71	0.39	0.04		39.73	30.23
2	16,288,944	184,800	88.00	234.87			0.04	0.01	6.51	17.50	1.20	0.27	0.03		27.80	21.15
3	16,288,944	182,000	88.00	234.87			0.04	0.01	6.51	17.50	1.20	0.27	0.03		27.80	21.15
6	32,891,492	449,400	73.19	427.58	6.93		0.03	0.06	2.98	30.03	1.15	0.40	0.65		15.86	10.42
7	52,288,604	735,000	71.00	689.77	11.19		0.05	0.10	4.81	48.45	1.85	0.64	1.06		25.59	16.81
167	1,999,998	126,000	16.00	22893.96	69.33	89.76			5.81	153.36	0.44	0.04		0.32	101.65	25.62
A201	126,000	14,700	8.60	17.06							0.58					2.61
A202	126,000	8,022	15.70	14.02							0.48					1.72
A203	126,000	2,982	42.00	10.04					2.96							1.17
A204	126,000	8,022	15.70	13.54								0.02				
A205	126,000	500	214.00	3.10					1.31							5.16
A206	126,000	2,700	47.00	9.75												
A207	126,000	8,022	15.70	14.74												0.68
				25,133.88												

*same as cumene

→ 12.57 T/yr

Floating Roof Storage Tanks

VOC emissions from floating roof storage tanks vary as a function of vapor pressure of the stored liquid, utilization rate of the tank, tank capacity and dimensions, tank color, and atmospheric conditions at the tank location (including average wind speed).

Emissions of HAPs were calculated using EPA's TANKS program, version 4.09b. The average weight percent of each HAP in the various liquids stored is based on PERF data.

Emissions from floating roof storage tanks were calculated using U.S. EPA TANKS program.

Table 6-7 presents the potential VOC emissions from the floating roof petroleum liquid storage tanks at NWTC. All TANKS data is contained in the attached disk. Potential HAP emissions from these tanks are shown in the emission summary tables (Tables 1-3 and 1-4) in Section 1.

Reference: TANKS, version 4.09b

Table 6-7 Northwest Terminalling Company Floating Roof Storage Tank Emissions

Tank	Thruput (gal)	Tank Volume (gal)	Turnover	Total VOC (lb/yr)	2,2,4-Trimethyl pentane	Benzene	Biphenyl	Cresol (-m)	Ethyl benzene	Hexane (-n)	Isopropyl benzene*	Naphthalene	Phenol	Styrene	Toluene	Xylene (-m)
4	6,300,000	340,200	19.00	43.05	0.13		0.03	0.02	0.07	0.57	0.03	0.07	0.10		0.32	0.24
5	22,925,202	483,000	47.00	4123.93	13.84	16.90			1.78	28.17	0.20	0.25		0.12	22.23	8.53
8	26,002,548	336,000	77.00	4077.15	14.33	17.06			2.11	28.11	0.26	0.37		0.15	23.85	10.30
12	32,904,459	588,000	56.00	27711.11	86.06	109.81			8.20	186.49	0.72	0.44		0.49	129.25	37.21
13	34,290,459	588,000	58.00	2822.42	10.79	12.28			1.93	19.81	0.25	0.41		0.14	19.00	9.62
208	69,407,006	924,000	75.00	28258.73	89.20	112.75			9.14	190.75	0.86	0.71		0.57	135.95	42.09
209	69,407,006	924,000	75.00	28258.73	89.20	112.75			9.14	190.75	0.86	0.71		0.57	135.95	42.09

*same as cumene

95,295.12 lb/yr
or 47.65 T/yr

Fugitive Emissions

EPA has provided a protocol for equipment leak emission estimates from various equipment at marketing terminals. Fugitive emissions at NWTC were calculated using these factors. Emissions of HAPs were calculated using the average weight percent of each HAP in the liquid.

Average emission factors do not require individual screening values for each component. All that is needed is the number of components in each source category. The number of components in each category is multiplied by the appropriate average emission factor. The resulting mass for each category then can be added together to determine the total fugitive emissions from the facility.

Table 6-8 presents the potential VOC emissions from the fugitive sources at NWTC. The number of units in each source category is given as well as the emission factor that was used. Potential HAP emissions from these sources are shown in the emissions summary tables (Table 1-3 and 1-4) in Section 1.

Reference: Protocol for Equipment Leak Emission Estimates, November 1995

Table 6-8

NORTHWEST TERMINALLING COMPANY
BOISE TERMINAL
POTENTIAL FUGITIVE VOC EMISSIONS
UPDATED April 2005

Source	Service	Number Of Units	Emission Factor* (lb/hr/unit)	Emissions (Tons/Yr)
Valves	Liquid	537	9.48E-05	0.22
Valves	Vapor	2	2.87E-05	2.5E-04
Fittings	Liquid	732	1.76E-05	5.7E-02
Fittings	Vapor	52	9.26E-05	2.1E-02
Pump Seals		17	1.19E-03	8.9E-02
Others	Liquid	43	2.87E-04	5.4E-02
		TOTAL		**0.44**

*Table 2-3 Marketing Terminal Average Emission Factors, Protocol for Equipment Leak Emission Estimates, EPA-453/R-95-017, November 1995
Emissions = (# of units)(emission factor)(hours/day)(365)/2000

Number of valves is actual times 1.1
Number of fittings is actual times 1.1
Number of pump seals is actual
Number of others is actual times 1.1

Actual counts increased to accomodate possible overlooked sources.

Truck loading fugitive emissions accounted for in the valves and fittings listed as in vapor service.

Paved Roads

Dust emissions from paved roads are a function of silt loading content and the average weight of the vehicles traveling on the roads. Site-specific data regarding silt content of paved roads at the Boise terminal were not available. Therefore, the silt loading content (10.0 g/m^2) was determined using a conservative estimate from roads with low average daily traffic. Total vehicle miles traveled were based on the number of vehicles loaded at the facility per day multiplied by the distance they travel on the paved lot. This equated to 20 miles per day or 7,300 miles/yr. A safety factor of 2 was applied to get 14,600 miles/year. The average weight of the vehicles traveling the road is 40 tons. For paved roads, the following equation from AP-42 was applied:

$$PAE(lb/yr) = k*(S/2)^{0.65}*(W/3)^{1.5}*VMT$$

where:

k = Particulate emissions factor (lb/VMT)
= 0.016 for PM_{10};
S = Silt loading content (g/m^2);
W = Average weight (tons) of the vehicles traveling the road; and
VMT = Vehicle miles traveled (miles/year).

Therefore:

$$PAE = k * (10.0/2)^{0.65} * (40/3)^{1.5} * 14{,}600$$

$$= 32{,}375 \text{ lbs/yr } PM_{10}$$

$$= 3.7 \text{ lbs/hr } PM_{10}$$

Reference: AP-42 Section 13.2.1, 12/03

Unpaved Roads

Dust emissions from unpaved roads are a function of silt content of road surface material, mean vehicle speed, mean vehicle weight, mean number of wheels, and number of days with at least 0.01 inches of precipitation. To estimate emissions from unpaved roads, the following assumptions were made:

- The silt content of the unpaved roads was assumed to be 16.75%. This is based on the approximation that the roads are 50% dirt and 50% gravel;
- The average weight of vehicles traveling on unpaved roads is 10 tons;
- The average speed of these vehicles was conservatively estimated to be 15 mph;
- The average vehicle traveling on the unpaved road has 6 wheels;
- There is an average of 90 days per year with at least 0.01 inches of precipitation in the Boise area; and
- The maximum vehicle miles traveled per year are 1,000.

Emissions were calculated using the following equation from AP-42:

$$PAE(lb/yr) = k*(s/12)^{a}* (W/3)^{b}*VMT$$

where:

k = empirical constant (lb/VMT)
= 1.5 for PM_{10};
a = empirical constant (dimensionless)
= 0.9 for PM_{10};
b = empirical constant (dimensionless)
= 0.45 for PM_{10};
s = Silt content of road surface material (%);
W = Mean vehicle weight (tons); and
VMT = Vehicle miles traveled (miles/year).

Therefore:

$$PAE = k*(16.75/12)^{0.9} * (10/3)^{0.45} * 1,000$$

= 3,481 lbs/yr PM_{10}

= 0.40 lbs/hr PM_{10} spread out over the year or
= 52 lbs/hr PM_{10} when vehicle is moving

Reference: AP-42 Section 11.2.1, 7/94

Maintenance and Repair Activities

The potential annual VOC emissions from repair and maintenance activities were calculated by adding the total potential emissions for the facility and multiplying by 2%. Potential VOC and HAP emissions from these sources are shown in the emissions summary tables (Tables 1-1, 1-2, 1-3, and 1-4) in Section 1.

Furnaces and Water Heaters

Particulate matter emissions are calculated using the following equation from 40 CFR Part 60, Appendix A, Method 19:

$$E = C * F_d [20.9/(20.9 - \%O_2)] \quad (1)$$

where:

- E = emission rate;
- C = concentration of particulate matter;
- F_d = the ratio of combustion gas volume to heat input (F factor)
  = 8710 dscf/mmBTU (dry standard cubic foot/million BTU) for natural gas.

The emission factor was taken from AP-42, Chapter 1, Table 1.4.1. The emission factor for particulate matter is 7.6 lb/10^6 ft^3. The average gross heating value of natural gas is approximately 1,000 BTU/scf, therefore:

$$E = (7.6 \text{ lb}/10^6 \text{ ft}^3) * (\text{ft}^3/1{,}000 \text{ BTU})$$

$$= 7.6\text{E-}9 \text{ lb/BTU} = 0.0076 \text{ lb/mmBTU}$$

Rearranging equation (1) and assuming 0% excess oxygen (to yield a conservative number):

$$C = E/F_d = (0.0076 \text{ lb/mmBTU})/(8710 \text{ dscf/mmBTU})$$

$$= 8.7\text{E-}7 \text{ lbs/dscf}$$

One pound equals 7,000 grains, therefore:

$$C = 0.006 \text{ grains/dscf}$$

IDAPA58.01.01.677 limits particulate matter from minor sources of fuel burning equipment (i.e. less than 10 mmBTU/hr), using natural gas, to 0.015 gr/dscf.

Reference: AP-42 Section 1.4, 7/98; 40 CFR Part 60, Appendix A, Method 19

SECTION 7

EXCESS EMISSION DOCUMENTATION

Excess emissions are defined by the State of Idaho Air Quality Regulations (IDAPA 58, Title 01, Chapter 01) as emissions of an air pollutant in excess of any applicable air quality standard, emission standard, emission limit, or permit terms or conditions. Excess emissions may occur from air pollution control units and emission sources during startup, shutdown, and scheduled maintenance. While excess emissions due to startup and shutdown are not anticipated at the terminal, scheduled maintenance activities, necessary to prevent upset conditions, are standard practice. Rather than including emissions from scheduled maintenance as excess emissions, they are accounted for as a routine emission source at the facility, as described below.

Maintenance Activities

Many repair and maintenance activities at the terminal may cause a temporary increase in emissions of regulated air pollutants. This includes such operations as tank cleaning, pump repair, etc. Due to the unpredictable nature of repairs, the emissions from these activities are difficult to calculate. We assume emissions from repair and maintenance activities equals two percent of the total facility emissions. Potential emissions calculations for repair and maintenance activities are found in Section 6.